She was a thin and delicate child, constantly taking coughs and colds, and very dyspeptic. On August 15th, she went to bed in her usual health, but in the middle of the night awoke intensely sick, cramped all over, and vomiting and purging dirty water, there being little difference between the liquid vomited and that purged. She was quite conscious, and complained of the cramps and pain in the stomach and bowels. I ordered a sinapism to the stomach, hot brandy and water, and a pill containing two grains of calomel and half-a grain of opium, the pill to be repeated if the first was vomited; or if kept, and the patient unrelieved, in four hours. At 10 A.M. on the 16th, she was completely prostrated, eyes sunk, pulse imperceptible, breathing almost imperceptible also, skin of a pale bluish colour, cold, and damp; had refused to take the pill or the brandy, but drank cold water, which was instantly rejected. The cramp had now left altogether; the eyes were half open, with a dark blue ring around them; she paid no attention when spoken to, but lay as if dead. No urine had been passed, and the suprapubic region was tympanitic. I ordered a complete hot mustard blanket bath with hot bottles around her to keep up the heat, enemata of strong warm beef-tea and brandy, with five minims of laudanum in the first, every two hours. It was with great difficulty that the parents could be got to adopt the above measures, nor *would* they have adopted them had I not procured a nurse, who energetically went about the performance of them, so hopeless did they think the case. Before noon, however, reaction was fairly established; she could speak, though still in a very hollow tone, and was persuaded to swallow one of the pills, and afterwards some ice and strong beef-tea. She made a good recovery.

The other cases in this division were much less severe; they had obstinate vomiting and purging, some of dirty water, others of biliary matter; all with more or less collapse, and all followed by intense weakness. In all who applied during the beginning of the attack, calomel and opium were given with effervescing draughts, ice, and sinapisms to the chest, stomach, and bowels. None of them required a whole bath. Where the vomiting had disappeared or never been present to a great extent, fuming nitrous acid with tincture of opium were given, which in most cases effectually relieved the purging. The greater number had cramps more or less.

The remaining 70 cases were all adults, the age varying from sixteen to sixty, but in only four cases was the collapse so alarming as to call for the application of the whole bath. In them, however, the effect was striking and most gratifying. In a few minutes the cramps disappeared, the skin became warm and red, the vomiting became less urgent, and a tendency to sleep induced. All four recovered. Two of the cases were above fifty years of age, and both were very severe cases and made slow recoveries.

With regard to the other treatment of these adult cases, the combination of calomel and opium was found to answer admirably, both in relieving the sickness and vomiting, and the pain and purging. We soon found that one grain of opium was of little use given as a single dose to an adult; but that a grain and a-half, when combined with three grains of calomel, and administered on the cessation of a wave of sickness (for it was always observed to come as if in waves), almost invariably remained on the stomach, relieving all the symptoms. Effervescing draughts were given for the intense thirst. When the calomel and opium failed to stay on the stomach, ice swallowed in small pieces invariably afforded relief. The remainder of the adult cases varied very much in severity, from what in the absence of an epidemic would be called severe bilious attacks, to what is usually denominated British cholera. The calomel and opium, ice and sinapism treatment was adopted in all, with all the success that could be desired. When diarrhœa persisted after the attack was over, nothing did so well as the fuming nitrous acid with laudanum every four hours. In one case, drachm-doses of carbonate of soda were given, with the effect of aggravating all the symptoms; it was therefore in that case discontinued, and not again tried.

So satisfied were Dr. Manson (a member of the British Medical Association) and myself of the admirable effects of the mustard bath in this class of cases (and he was equally pleased with it in the cases in which he ordered it), that we determined, if unfortunately at any time we should be visited with an epidemic of real Asiatic cholera, to give the treatment a fair trial in it also. It was with much pleasure, and great interest, therefore, that I read Dr. Bullar's paper in the JOURNAL recommending the same line of treatment, and I hope others will give it a fair trial too. As regards the form of the bath, I think the blanket bath should be preferred, as being in most cases more readily and more quickly available, and also more easily applied in very bad cases.

Transactions of Branches.

EAST ANGLIAN BRANCH.

ON AMPUTATION IN GANGRENE.

By WILLIAM CADGE, Esq., Norwich.

[*Read July 14th*, 1865.]

Two years ago, at our annual meeting at Yarmouth, I had the honour of reading a paper on the subject of amputation for traumatic gangrene. My object was, in that communication, to oppose the common practice of *immediate* amputation in all cases of traumatic gangrene of a limb; and I endeavoured to support my views by the narration of cases of great interest bearing directly on the question. I return to the subject now, in order to enforce the practice I then advocated; to add a few fresh cases, and still further to ventilate the matter by eliciting the opinions of the members now present.

The rule of practice, as at present taught in schools and in almost all modern surgical works, is this:

1. In senile gangrene, or gangrene from any spontaneous cause, such as arteritis, embolus, etc., amputation is not to be thought of until the mortification has ceased and a line of separation has formed.

2. In traumatic gangrene, whether from fracture, laceration, gunshot wound, or wound or ligature of arteries, amputation should be done *immediately* the gangrene has manifested itself, and before the line of separation has formed.

The reasons assigned for these opposite modes of treatment are clear and simple. In gangrene from internal causes, we are to wait for a line of separation, because we cannot tell how far the mortification will spread; and, if we operate, we may operate in parts already doomed, and the disease will reappear in the stump. On the other hand, in traumatic gangrene, we are not to wait for its cessation, lest the disease should spread rapidly to the trunk, and life will be lost.

Now, with all submission, I would take exception both to the practice and to the reasons by which the practice is supported. In both these classes of gangrene, I think that the bare fact of the cessation or spread of the gangrene should not be the only or

even the chief guide by which we decide the question of amputation. I will speak first of gangrene from internal causes. It is very seldom that a question of amputation can arise in cases of senile gangrene. Usually, from the age of the patient, the diseased condition of the arterial vessels, or the lessened vitality of the whole system, amputation can seldom be thought of; but it will occasionally happen that the disease commences in a system which we would consider able to sustain the shock of operation. In such a case, supposing that the whole limb, say the whole foot, is engaged, why should we wait and see the patient's strength exhausted by the continued and intense suffering which usually attends the disease? Why wait for that line of separation which may never occur? Why not amputate at a point well above the dead parts? I have seen many cases of senile gangrene; but I never saw or heard of one in which it reached above the knee-joint. Either the gangrene ceases, or the patient dies worn out before it reaches so high. Amputation, therefore, in a case otherwise suited for operation, should be done above the knee, say in the middle of the thigh, without any reference to, or waiting for, the cessation of the gangrene. Some years ago, such a case occurred in the Norwich Hospital, in a woman whose general condition seemed favourable for an operation. One foot was black from senile gangrene, and there was no sign of its arrest. I had long been watching for such a case; and I urged my colleague, who had charge of the patient, to amputate at once. He did so, a few inches above the knee; and the stump healed fairly. Let me illustrate the subject further by reference to an interesting case now under my care in the Norwich Hospital.

A farm labourer, of healthy appearance and abstemious habits, aged 34, was admitted with gangrene of the toes of the right foot. It came on spontaneously, and extended slowly over the instep. The remainder of the foot and ankle was of a dusky red colour, and evidently doomed to die; but the progress of the disease was very slow. The pain was intolerable, and could be mitigated only to a slight extent by opiates. The subcutaneous injection of morphia gave most relief; but, with all that could be done, he still suffered acutely; his health and strength yielded, and he implored to have the limb removed. The history of the case was this. Three or four weeks before the commencement of the gangrene, he felt pain and tenderness in the calf of the leg, and it was hard. He thought but little of it; and it ceased in about a week. Connecting this history with the mortification, I considered that this was a case originally of arteritis, leading to obstruction of the circulation and to gangrene. To what extent the disease in the arterial coats might extend, I could not tell. There was doubtful pulsation in the popliteal, and the femoral artery at the groin beat but feebly; still the pain and tenderness in the calf seemed to point to that situation as the chief seat of mischief, and I hoped that the gangrene would not extend above that part. I determined to amputate without waiting for the mortification to stop; but I hesitated whether to do it above or below the knee. The former would doubtless have been the safer; but to save the knee is a very important matter to a labouring man, and I therefore amputated close to the joint by making skin-flaps and a circular section of muscles. The popliteal artery bled but little, but the smaller ones more freely; the flaps sloughed to some extent; and superficial necrosis of the bones occurred. But now, a month after the operation, all sloughing has ceased, the stump is covered with healthy granulations, and there is a fair chance of recovery. Inflammation and commencing calcification of the inner coat of the arteries was found on examination; there was no coagulum; but the tibials were shrunken and empty.

Here there are two cases in which the "golden rule" of waiting for the line of demarcation was successfully departed from. Others might be quoted, particularly five or six by Mr. James of Exeter, in which amputation of the thigh was done during the progress of the gangrene.

But I hasten on to speak of the second class of cases—viz., of traumatic gangrene of a limb, the result of external violence, fracture, injury or ligature of arteries, gunshot wound, etc. In these cases, we are told to amputate the limb as soon as the mortification has begun, above or on a level with the original seat of injury. It is this rule especially which, I think, requires reconsideration and alteration. Why, I would ask, should we be in such a hurry to remove a limb when gangrene has commenced? There is no fear of its extension beyond the local injury which led to it. At least, in not more than one in a hundred cases would it do so; and in that one case the mortification would of necessity depend more on some constitutional defect than on the local injury; and here amputation would be of no avail. Let us take a case—one which has recently occurred in my hospital practice.

A farm labourer, aged 28, was admitted February 9th, 1865, with a deep lacerated wound in the popliteal space. A surgeon had seen it, and stitched up the wound. When he reached the hospital, he was greatly collapsed and very pale. There was no sensation below the middle of the leg, and he could not move the foot. A clot showed between the stitches in the wound, but there was no bleeding. The next day, the foot looked blue, but it was warm. The third day, it was clearly mortified, and no line of demarcation was visible; the leg was not swollen, but was hard and painful; the wound was discharging blood and pus. Now was the time when, by the rule of surgery, I should have amputated the thigh above the wound in the ham. But what was the state of the patient? He had not fully recovered from the first shock and loss of blood; his pulse was feeble, at 130 to 140; his tongue dry and white; the surface of the body pale and bloodless. I have a firm conviction that amputation, if done at this time, would have proved quickly fatal. Why be in a hurry to add a second shock and loss of blood to that from which he had barely recovered? By waiting until the full establishment of suppuration, I hoped that much of the fever would pass away; that he would still more recover from the first collapse and depression; and I had no fear that the mortification would extend above the wound in the thigh. Accordingly, every attention was given to maintain his strength; he took food freely, and improved for a time. Suppuration became free, and the wound showed healthy granulations. The mortification spread very slowly, and for some days seemed to stop about the lower third of the leg. On the eleventh day after the accident, I amputated the thigh by skin-flaps and circular division of the muscles. At this time he had become very weak and hectic. It would have been better to have operated two or three days before; and I intended to have done so, but was prevented by engagements. For some days he was very low and delirious; but he gradually improved; took food freely; and the stump, which at first was without action and sloughy, slowly granulated, and the patient fully recovered.

This case, I think, shows, and several others which I have recorded show even more vividly, the wisdom of selecting the time for operating, not by the mere occurrence of mortification, but entirely according to

the state of the patient. It may be that he has suffered so little from the first injury, that he can well bear the additional shock of amputation, which may then be done as soon as gangrene has clearly set in; but much, very much more frequently, it will show good surgery to wait until the violence of the constitutional disturbance attending the occurrence of gangrene has passed away, and until suppuration has been established. By this time the mortification will very probably have ceased; there will be little or no swelling, or serous effusion, or extravasated blood, in the part where we wish to operate; the system will have become calmer; hectic fever will, perhaps, have begun to show itself; and the operation may be done with the best prospect of success. Moreover, by delay we may sometimes save a portion of the limb. Thus, in gangrene following ligature or wound of an artery, all modern writers on surgery recommend immediate amputation above the ligature or wound. But how can we say that the gangrene will spread up to the ligature? Such a case I have reported in the paper referred to. A man received a punctured wound of the popliteal artery; the wound healed at once; gangrene of the foot followed; and the surgeon requested my attendance, with a view to immediate amputation. I advised delay. The mortification ceased about the middle of the leg; and eventually the limb was removed below the knee, and not above the wound of the artery. The patient recovered rapidly.

Without entering more fully into the details of this important subject, which I should like to do, I will sum up thus. In those few cases of gangrene from internal causes in which amputation is permissible, we should decide the time for operation and the point of election less by the formation or non-formation of the line of separation, than by the other circumstances of the case, the general condition of the patient, and particularly by the amount of disease in the arterial system. In the other class, viz., gangrene from external causes—traumatic gangrene—I would say: Let us not be hurried into operating too soon; let us watch the spread of the disease without fear, so as to know to what extent it is likely to go; let us seek to maintain and restore the strength of the patient; let the period of active febrile excitement pass away, and suppuration be in full force,—then, and not so well till then, may we relieve him of the burden; and, judging from considerable experience, I would say that we may save many a life which, by over haste and the blind obedience to a "golden" but too narrow and dogmatic rule of practice, would be lost.

SOUTH-EASTERN BRANCH: WEST KENT DISTRICT MEDICAL MEETINGS.

CASE OF TETANUS.

By Frederick P. Atkinson, M.B., M.C., St. Bartholomew's Hospital, Rochester.

[*Read September 29th*, 1865.]

Alfred Sage, aged 28, labourer, residing at Borstal (in the city of Rochester), was admitted into St. Bartholomew's Hospital, March 27th, 1865, with violent tetanic spasms affecting the whole trunk. He was seized, he said, about two days previously with pain in the back of the neck, and some difficulty in swallowing. No cause could be assigned for the attack. He had not been exposed much to cold or heat, and had not pricked or wounded himself in any way. He appeared to be a man of robust and vigorous constitution, and had never been the subject of ill health. There were some small superficial indolent-looking ulcers on the legs; but these had existed, he said, for years. During the fits, the extremities were rigidly extended and the back bent, so that the body rested, as it were, on the head and heels. The eyes were fixed, and the jaws, which were separated about an inch, were immovable. The forehead was drawn into wrinkles, and was hot and perspiring. Pulse 96. There appeared to be some slight remission about every ten minutes. He was ordered a warm bath on admission and a minim of croton oil; a belladonna plaster to the spine, and a mixture, consisting of eight grains of saccharine carbonate of iron and twenty-five minims of tincture of cannabis Indica, every hour; also a liberal allowance of beef-tea and wine. In the evening, the bowels not having been moved, he was ordered an enema of turpentine.

March 28th. He slept about half an hour last night, and the fits were a little less frequent and painful. He was ordered to have two grains of calomel and half a grain of powdered opium night and morning.

March 29th. He slept about four or five hours last night; but the fits were more frequent and severe again this morning. There was great dyspnœa. The skin was clammy. Pulse small. He continued in this state till about twelve o'clock, when he sank exhausted.

Nothing was revealed by the *post mortem* examination. The spinal cord, however, was not inspected, as it should have been, microscopically.

Remarks. It seems to me that the treatment of tetanus has hitherto been directed towards an alleviation of the symptoms, rather than the cure of the disease. Lockhart Clarke has now demonstrated that the true cause of tetanus is softening or degeneration of the upper part of the spinal cord; and thus shewn, I think, why mercury, tartar emetic, bloodletting, tobacco enemata, and sedatives, have proved of so little avail. Stimulants, with sulphate of zinc and phosphoric acid, seem to me to hold out the greatest chance in the cure of this fatal disease.

EAST YORK AND NORTH LINCOLN BRANCH.

CASE OF TWINS.

By J. Morley, Esq., Barton-on-Humber.

[*Read October 4th*, 1865.]

On September 18th, 1864, between 12 and 1 P.M., I was requested to attend, for Mr. Eddie (during his temporary absence), Mrs. J. B., aged 22, residing at Barton, in her first confinement. The catamenia last appeared on November 27th, 1863; and she was married between this date and the end of December.

On examination, I found the os uteri fully dilated, the vertex presenting; and at 2 P.M., she gave birth to a living male child, of the average size, which appeared to have arrived at the full period of utero-gestation. Upon further examination, I detected another fœtus; and, having ruptured the membranes, the feet presented, and at 2.15 P.M. a male child was born alive, which survived fifty-five minutes. This child measured after death only twelve inches and a half. The testes had not entered the scrotum; and it presented generally the appearance of a fœtus that had not arrived at more than the seventh month of utero-gestation. The placentæ were continuous, and the membranes divided into two compartments.

As I had not met with a similar phenomenon out of nearly three thousand midwifery cases which I have attended, I thought it worthy of being brought before the members of this Branch, and hope that its bearing on the subject of generation will give rise to a discussion which will throw some light on this obscure branch of physiology.